



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,206	06/17/2005	David Philip Williams	034279-009	2340

21839 7590 06/08/2007
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

BLEVINS, JERRY M

ART UNIT	PAPER NUMBER
----------	--------------

2883

MAIL DATE	DELIVERY MODE
-----------	---------------

06/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/539,206

Applicant(s)

WILLIAMS ET AL.

Examiner

Jerry Martin Blevins

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-21, 23, 24 and 30-36 is/are rejected.
- 7) ☒ Claim(s) 8, 22 and 25-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 10/20/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 9-21, 23, 24, and 30, 31, and 33-35 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2006/0263022 to Han.

Regarding claim 1, Han teaches a preform for a photonic bandgap optical fiber waveguide (paragraphs 6, 24, 74, and 82-84) comprising a stack of parallel, elongate primary elements (Figures 3E and 3F, elements 130) and elongate secondary elements (132), in which, in the transverse cross section, the primary elements have a largest external dimension (diameter) and groups of primary elements define interstitial regions (periodic triangular grouping of three primary elements), in at least some of which there is or are one or more secondary elements having a largest external dimension (diameter) which is less than one third of the size of each of the largest external dimensions of the surrounding primary elements (Figures 3E and 3F).

Regarding claims 2-4, Han teaches that substantially all of the interstitial regions are defined by three primary elements (Figures 3E and 3F show a triangular lattice pattern of primary elements 130).

Regarding claims 5 and 6, Han teaches that substantially all of the interstitial regions are enclosed by abutting primary elements (as shown in Figures 1A, 2, and 3A-3D).

Regarding claim 7, Han teaches that each primary element that defines one interstitial region abuts at least one or more secondary elements that is (or are) in that region (Figures 3E and 3F).

Regarding claim 9, Han teaches that at least some of the interstitial regions contain plural secondary elements (Figure 3F).

Regarding claims 10 and 11, Han teaches that at least some of the secondary element are capillaries (in the sense that they are small diameter) and rods (in the sense that they are solid), as evidenced by Figures 3E and 3F.

Regarding claim 12, Han teaches that at least some of the primary elements are capillaries (in the sense that they are a hollow tube, as evidenced in Figures 3E and 3F).

Regarding claims 13, 14, and 17, Han teaches that substantially all of the primary elements have the same, circular cross sectional shape and a similar largest external dimension (Figures 3E and 3F).

Regarding claim 15, Han teaches that each interstitial region containing one or more secondary elements contains substantially the same arrangement of one or more secondary elements (Figures 3E and 3F).

Regarding claim 16, Han teaches that substantially all interstitial voids contain one or more secondary elements (Figures 3E and 3F).

Regarding claim 18-21, Han teaches that at least a portion of the perform comprises a periodic arrangement of primary and secondary elements (triangular lattice of 3 primary and 3 secondary elements) having a first characteristic pitch (the distance between two subsequent lattices), a second characteristic pitch (the distance between two subsequent primary elements 130), and a third characteristic pitch (the distance between two subsequent secondary elements 132), wherein the second and third characteristic pitches are the same (due to the equidistant patterning of primary and secondary elements), as shown in Figure 3F.

Regarding claims 23 and 24, Han teaches that the primary elements form a substantially triangular and hexagonal array, as shown in Figures 1A, 2, and 3A-3F (where the triangular array is as described above and the hexagonal array is periodic array of every 6 periodic triangular arrays formed in a hexagonal structure).

Regarding claims 30 and 31, Han teaches a photonic bandgap fiber formed from the preform (paragraphs 6, 24, 74, and 82-84).

Regarding claim 33, Han teaches heating and drawing the preform in one or more stages into the fiber (abstract, paragraphs 9, 9, 67, 68, 72, and 83, Figures 4 and 5).

Regarding claim 34, Han teaches arranging the primary elements to form interstitial regions and then inserting, in a longitudinal manner, the secondary elements (paragraph 18, Figures 3E and 3F).

Regarding claim 35, Han teaches laying discrete layers of primary and secondary elements on to one another to form a stack of primary and secondary elements (paragraph 56).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Han in view of US 2005/0147370 to Yusoff et al.

Regarding claim 32, Han teaches the limitations of the base claim 32. Han does not teach a minimum loss less than 12 dB/km. Yusoff teaches a photonic bandgap fiber with a minimum loss less than 12 dB/km (paragraphs 105 and 106). It would have been obvious to one of ordinary skill in the art at the time of the invention to make the optical fiber of Han with a minimum loss less than 12 dB/km, as taught by Yusoff. The motivation would have been to reduce losses.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Han.

Regarding claim 36, Han teaches the limitations of the base claim 35. Han does not specifically teach using automated equipment to position primary and secondary elements. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to automate the positioning of the primary and secondary elements, since it has been held that broadly providing a mechanical or automatic means to replace manual activity which has accomplished the same result involves only routine skill in the art. In re Venner, 120 USPQ 192. The motivation would have been to increase precision, accuracy, and ease of positioning of primary and secondary elements.

Allowable Subject Matter

Claims 8, 22, and 25-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 8, Han teaches the limitations of the base claim 1. However, Han, alone or in combination with the prior art, fails to teach or render obvious that the primary elements are non-tessellating. Rather, Han teaches that the primary elements form a mosaic patterning, as evidenced in Figures 1-3 and 7-9.

Regarding claim 22, Han teaches the limitations of the base claim 20. However, Han, alone or in combination with the prior art, fails to teach or render obvious that the third characteristic pitch is larger than the second characteristic pitch. Rather, Han teaches that the second and third characteristic pitches are the same, as discussed in the above rejection of claim 21.

Regarding claim 25, Han teaches the limitations of the base claim 1. However, Han, alone or in combination with the prior art, fails to teach or render obvious that the primary and secondary elongate elements are arranged around a further parallel elongate element.

Claims 26 and 27 contain allowable subject matter due to their dependence from claim 25.

Regarding claim 28, Han teaches the limitations of the base claim 1. However, Han, alone or in combination with the prior art, fails to teach or render obvious that the arrangement of primary and secondary elongate elements are enclosed by a large diameter capillary, thereby forming a plurality of third interstitial regions between the inner periphery of the large diameter capillary and the arrangement of primary and secondary elements.

Claim 29 contains allowable subject matter due to its dependence from claim 28.

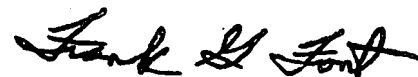
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMB



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800